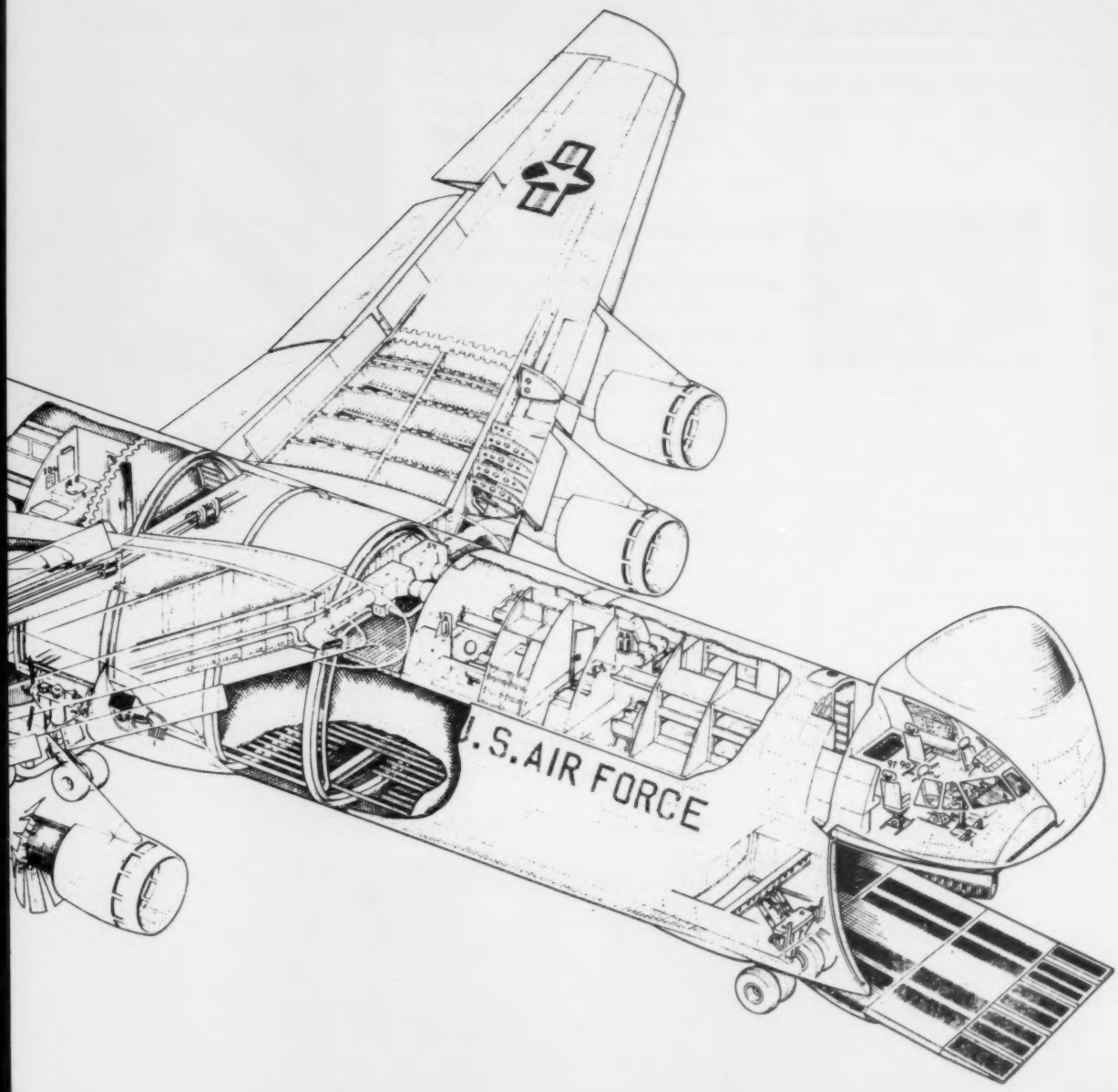
The MAC Flyer

OCTOBER 1978



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The MAC Flyer

For Greater Safety and Efficiency
in MAC Air Operations

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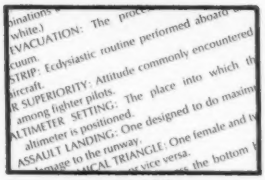

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Cooperate and Survive

by Col Ruel J. Neeley
HQ MAC Director of Safety

Our airplanes may have become safer over the years, but the environment we fly them in hasn't. Now more than ever, staying alive in that hostile environment requires a team effort.

Aircrew coordination is perhaps one of the most overworked yet misunderstood terms in our flying vocabulary. It is a perfect catchall phrase, and it's frequently mentioned in inspection and accident reports. Because it is cussed and discussed so much, there is a tendency for us to gloss over it with the assumption that nothing can possibly be said on the subject that won't bore everybody to tears. A rash of serious flying mishaps and fatal accidents directly attributable to a breakdown in aircrew coordination, however, leads us to one inescapable conclusion: We have not succeeded in getting "the word" on the subject of crew coordination to all our people, nor have we made a strong enough impression on those who heard—but didn't heed—the message.

Ideally, an airplane flown by a crew should be several times safer than one flown by a single pilot. That wasn't the case, however, when four crewmembers on the flight deck of a MAC transport allowed it, quite literally, to quit flying and fall out of the sky. No emergency was in progress, no foul weather complicated things, and yet with four pairs of experienced eyes available to cross-check during the approach, nobody noticed the airspeed slip away to the point where the aircraft stalled and crashed.

So what exactly do we mean when we say that aircrew coordination could have prevented such an accident? The idea, quite simply, is that an aircrew should be working together as a well-disciplined team whose strengths and weaknesses complement and compensate each other. Primarily, it hinges on the relationship between the aircraft commander and the rest of the crew.

It means that the aircraft commander sets the tone of professionalism and discipline that is the standard for the whole crew. He doesn't make light of established procedures and regulations because he doesn't agree with them. He doesn't speed through checklists and briefings haphazardly with the assumption that everybody is familiar with them from having done the routines so many times before. He talks to his crewmembers and tells

them what he expects from them during all phases of flight—especially the critical times from takeoff to leveloff and from the start of letdown until the aircraft is safely in the chocks. Nobody on the crew should be in doubt as to what is expected of them or what is going to happen as the flight progresses. A good aircraft commander makes the maximum use of each aircrewmember's expertise, knowledge, and ability so that he can concentrate on important and often critical decisions and flight maneuvers. As long as that aircraft is moving, on the ground or in the air, every decision the aircraft commander makes has to be the best one possible.

But the aircraft commander can't do the job all alone. For the rest of the crewmembers, coordination means listening up to everything going on in the cockpit and paying attention to more than just individual areas of responsibility. It means knowing tech orders and directives expertly and learning as much as you can about the workings of the aircraft and the MAC system in general. It means a willingness to "double in brass" or take on added responsibility when the situation calls for it—especially, for example, during critical phases of flight. You've got to be able to take up the slack for crewmembers with limited experience, and you've got to speak up when you see something being done wrong—regardless of whether you are an "old head" or the new guy on the block. Don't be afraid to ask questions. None of us are immune to mistakes.

Crew coordination really boils down to discipline and a positive attitude about what you're doing. It's knowing your job and doing the best you can regardless of whether somebody is looking over your shoulder or not.

A lot of information is available on the disastrous accidents caused by aircrews that lacked sufficient involvement, coordination and discipline; but the lessons to be learned are basic. The airmen involved in those accidents were people just like you and me; and they probably felt, like we do most of the time, that such a disaster couldn't happen to them. I am willing to bet that if they had the opportunity, they would view some of their practices and attitudes toward their jobs as aircrewmembers with a considerably more critical eye. Unfortunately, they don't have that choice now. They had to pay a very dear price for their mistakes, but their errors in the cockpit provide the rest of us with a backdrop against which we can take a close look at our own professionalism, make improvements wherever needed, and perhaps prevent such needless tragedy from occurring in our own flying careers.

"The idea, quite simply, is that an aircrew should be working together as a well-disciplined team whose strengths and weaknesses complement each other."

Honorable Mention, 1978 MAC Flying Safety Writing Contest

NO SIGNIFICANT NOTAMS

by Flt Lt W. R. Shoobridge
Royal Australian Air Force

It was only a small bit of information, but it made all the difference in the world.

The summer months of January and February are the height of the cyclone season in northern Australia. This year was worse than most, bringing widespread flooding in the northeast, with very high losses of crops, stock and property. Sadly, the toll of human life was also heavier than could reasonably have been expected.

With the skills achieved during many years of national disaster relief operations, the Royal Australian Air Force once again came to the fore. Transport aircraft were committed to search and rescue and relief operations in support of human and animal life.

Such was the demand on RAAF resources that even a venerable C-47 had been deployed to assist. The Dakota crew had been on duty for two weeks, operating out of a coastal civilian airfield on fodder-dropping operations to sustain the thousands of sheep and cattle stranded on high ground in the flooded areas. It had been a hard flying effort, amounting to some 130 hours and 81 sorties, but it had also been especially rewarding and successful.

Now the aircraft and crew had returned to the RAAF base that was headquarters for the relief operation. After a welcome day's rest, they would return to home base via an intermediate en route stop to offload duty passengers.

The fact that the mission had gone so well was due in no small part to the professional ability of the crew. The captain, Flight Lieutenant Floyd Jenkins, and the navigator, Flight Lieutenant Mark Spencer, had both been with the squadron for over four years, and each carried an "above-average" category. The copilot, Pilot Officer Jim Langley, with them only for a year since graduating from pilot's course, was coming along well. Indeed, the past two weeks had allowed him to complete most of the requirements for upgrade to captain. Jenkins was well pleased with his student's progress and resolved to use the homeward trip as the final route check for upgrade.

On the morning of departure the crew presented themselves at Flight Planning. The return trip was simple—four hours to the passenger stop, then another five hours home. Jenkins allowed his copilot to do the planning under the watchful eye of the navigator. He was pleased to see Langley reduce fuel load to limit the takeoff gross weight and permit safe single-engine climb along the ini-

tial departure track—there were some high hills not too far to the south. Weather for the first half of the first leg was reasonable, but could be expected to deteriorate after that. Terminal forecast was for overcast conditions, cloud base 1,000 feet in rain; but the captain saw no problems. They would arrive in daylight; GCA was available and they had plenty of holding and diversion fuel.

Notams for civilian diversion and alternate fields were not available. The duty controller said that since this was a military field, it was too complicated to get daily notams from the nearest civil ATC centre, 40 miles away. Jenkins was not very happy about this and rang the civil duty controller. He found that the Preflight Information Bulletin (PFIB) the crew had been issued before departure from home base was still current and there were no significant changes. Reassured by this information, the crew finished their planning and headed for the aircraft.

Departure, however, was delayed for some time while maintenance replaced a ruptured hydraulic accumulator diaphragm. The aircraft lifted off at 1700 local with a planned arrival of 2115, which would be after last light. Jenkins had by then resolved to stay overnight at the intermediate stop, since to continue home would put them well over duty time. Besides, they would easily make the bar before the shutters went down.

As Rescue 846 lumbered along track in a climb to 9,500 feet, the crew grumbled at the malfunction that had caused the delay—the first problem they had had during the operation. Obviously the Gooney did not want to go home.

Not long after departure, one of the passengers enquired as to the chances of being dropped at the destination international civil airport. Since departure had been late, the 30-mile drive into the city from the RAAF base would mean a home-time for the passengers of well after midnight. The crew agreed, replanned in the air for the extra stop, and set the aircraft into cruise configuration in fine weather. To ease any anxieties, ATC advised them there were no significant notams for the revised route. Destination weather would require an ILS approach, but otherwise should be okay on arrival.

They were an hour out when they found that terminal weather was deteriorating.

They were an hour out when they found that terminal weather was deteriorating—8/8ths at 800 feet, rain, visibility 4,000 metres. This was above published ILS minimums, and Jenkins mused that it was a good chance for his up-and-coming captain, sitting in the left seat, to shoot a real ILS in the weather—something that doesn't happen too often in Australia.

At 30 minutes out, they completed the briefing and the approach checklist. By this time the C-47 was cruising in darkness, cloud, and light rain. Turbulence was slight and infrequent, the autopilot was working well, and things were progressing with the usual quiet efficiency the crew liked and strove to achieve.

At 50 miles, Control cleared Rescue 846 to 5,000 feet. Terminal weather on the VOR was runway 15, wind 170/15, temperature 25°C, QNH 1011, cloud 8/8ths at 600 feet, rain, visibility 5,000 metres in haze.

At 25 miles Control handed the flight over to Approach, who cleared them to 3,000 feet and began vectoring the C-47 to the locator for a straight-in ILS. Langley was now hand-flying the aircraft and the prelanding checks were complete, except for the gear. The passengers were strapped in, anxious to be on the ground.

The Dakota started descending as they passed the locator—110 knots, 500 feet per minute, ¼ flap, glide slope and localiser needles centered. Couldn't be better, thought Langley, already envisaging the captain's endorsement in his logbook. Eight miles to touchdown now, 2,500 feet, still in the weather, but flying well on instruments. Jenkins advised he was switching to tower and instructed the left-seater to stay on the clocks until he was told "visual, runway in sight" or "decision height—overshoot."

Tower cleared the aircraft to land, advising that the cloud base was 300 feet, visibility 3,000 metres.

"Okay," briefed the captain, "minimums are 300 feet. We should make it with a bit of luck."

Three miles out now, passing 900 feet, all set for landing, pilot on instruments, captain glancing outside for the runway lights and

VASI to appear through the murk.

"Got a couple of lights on the ground through the driftsight," announced the navigator.

"Five hundred feet, two hundred to decision height, still nothing ahead," Jenkins announced as he peered through the windscreen into the reflection of the landing lights on the rain and cloud. The idea crossed his mind that they might not get in after all—the ceiling seemed to be lower than reported.

With a shattering thump the left engine and undercarriage slammed into something.

"Approaching decision height, runway starting to app—PULL UP! PULL UP! PULL UP!"

With a shattering thump the left engine and undercarriage slammed into something. The aircraft lurched to the left and pitched down. The left fire warning flashed on and the aeroplane started buffeting violently.

"I've got it," shouted Jenkins. "Get out a Mayday—crash landing!" He used all his strength to control the yaw with right rudder, pulled the nose up and went to full power on the right engine. The aircraft, at the limits of controllability, responded sluggishly. "Feather the port—it's still on fire!" he instructed Langley.

At 200 feet, with the airspeed dropping toward 70 knots, Jenkins fought for control. Dimly, through the rain, he saw the VASI lights appear. All the bars were vivid red. Damn, he thought, a hell of a way to finish.

In the tower the senior controller peered through the rain, watching for the C-47 to appear. They should get in, he thought; the DC-9 ahead of them had made it.

The controller saw the Dakota break out of the rain and mist, far lower than normal. The left propeller was turning slowly, the left undercarriage was missing, and a bright orange glow was visible behind the engine. The nose dipped, rose, dipped again. Then the Gooney dropped onto the underrun area, dug in the port wing, and slid to a stop on the threshold of the runway. Fire services were in action within 30 seconds.

"They must have hit the crane on the building," was the first comment made in the tower.

The Court of Enquiry had little difficulty in finding the cause of the accident. During an ILS approach in IMC, the aeroplane had collided with a 350-foot-high industrial crane on a new building a mile from the threshold. Miraculously, no serious injuries had occurred, and the aircraft was repairable. The captain was commended for his handling of the aircraft in averting a disaster.

What the court found harder to understand was why the crew was not aware of the notam which raised the ILS minimums from 300 to 500 feet because of cranes working up to 350 feet AGL on buildings within two miles of the runway. Although the notam had been included on the PFIB they were issued two weeks before, the crew stated they had not seen it.

It was not until the actual PFIB that the crew had carried with them was produced that the reason for the omission became apparent. The ten-page PFIB covered airfields, navigation, and notams over a considerable area. It was found folded back to the page for the airfield where the accident had happened. But when the pages had been stapled together, the staples were inserted just a bit further down the page than normal.

Underneath the staples, effectively hidden from the ill-fated crew, was the one significant notam.

ABOUT THE AUTHOR

Flight Lieutenant Shoobridge joined the RAAF in 1959 and completed a five-year engineering apprenticeship before becoming a pilot. He's flown Neptunes, Orions, and Dakotas (C-47's), and has over 3,000 hours in the venerable Gooney Bird. The author is currently serving as a C-47 check captain, flight commander, and squadron safety officer in Papua, New Guinea.

Mishap with a Moral

Maintain VFR

Faced with IFR conditions on a VFR flight plan, the helicopter crew had to make some decisions. Almost all of them were right.

A cold front was pushing down from the north as the helicopter crew prepared for a 250-mile VFR cross-country flight. Weather along the route didn't look too good—extensive rain showers, an area of thunderstorms, ground fog, and zero ceilings over the hills. The forecaster told the crew that they'd be in and out of clouds at their planned 1,000-foot cruising altitude and warned them that the weather might force them to land en route.

Ironically, the weather prevented the crew from filing IFR. Since they'd be in clouds at the minimum IFR altitude, they wouldn't be able to avoid the forecast thunderstorms visually as required by regulation. But the forecast at lower altitudes included minimum visibility of three miles outside of clouds, so they filed VFR and took off.

As the chopper headed south toward a large lake near the departure base, approach control asked for their initial heading and cruise altitude.

". . . south," was the answer, "and . . . we're

trying to get up to about 1,000 feet." At the time, the aircraft was some 200 feet AGL. During the next 11 minutes, it would climb no higher than approximately 500 feet AGL.

A minute later, the controller called with a weather advisory: "I'm showing . . . moderate precipitation about 12 o'clock, eight miles." The crew acknowledged the transmission and continued southbound.

About this time, the noise of the rotor blades caught the attention of two witnesses on the ground. "My God, he can't be more than a hundred feet off the ground," one remarked. The second witness worried that the helicopter would hit fog-obscured radio towers in the area.

The flight continued south over the lake for another seven minutes, then the crew called approach control. "The ceilings are down, they're right down here on the deck. We're going to make a 180 and head back . . ."

". . . roger," approach control answered. "Continue northbound . . . you can enter traffic for 17."

Some discussion of the weather followed. The controller told the crew that the weather appeared to be breaking up to the west; the crew remarked that there was a "scattered layer that's quite low over the hills here." Finally, the controller cleared the crew to enter right traffic at their departure base and contact tower.

Shortly thereafter, two more witnesses heard the helicopter as it crossed the shoreline of the lake and headed back over land. Neither could see the aircraft because of the dense fog, but both stated it sounded extremely low.

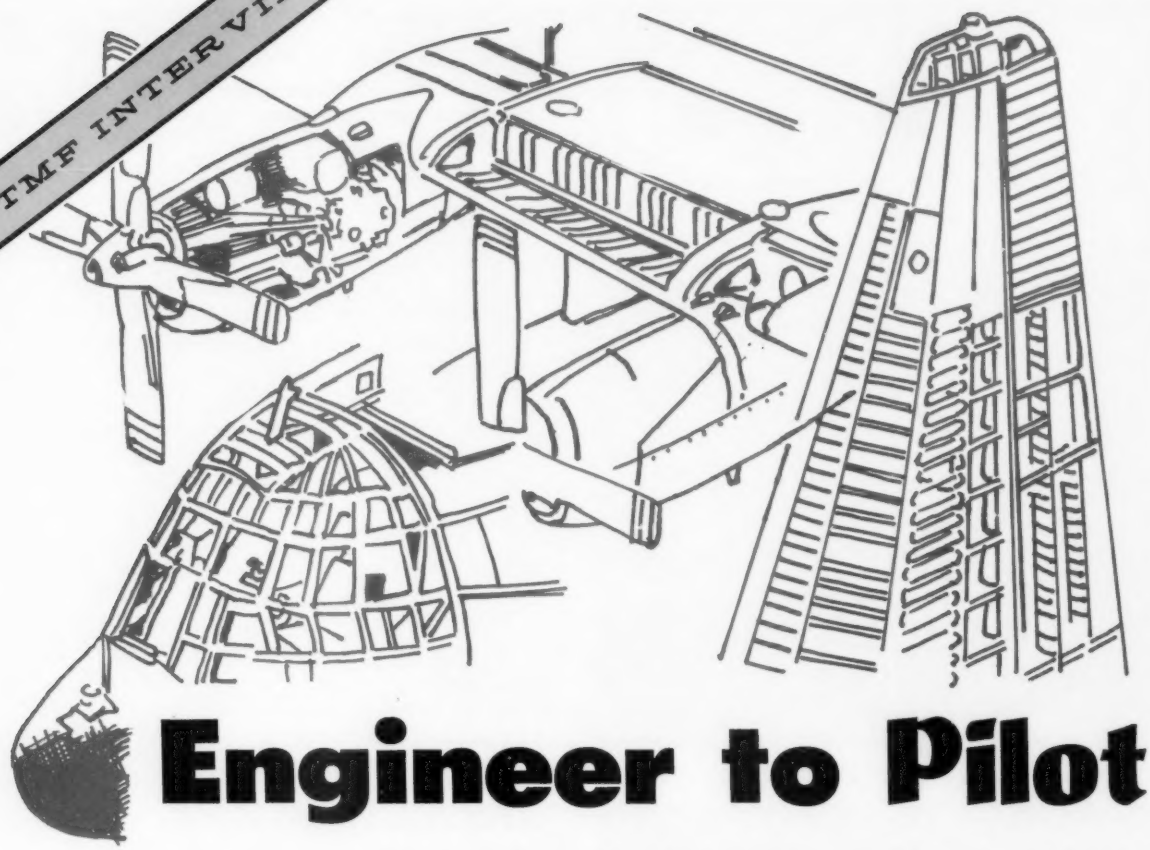
Fourteen minutes after takeoff, the helicopter slammed into a hill about 10 miles south of the base and about 700 feet above field elevation. There were no survivors.

If you look at this accident sequence as a series of choices and decisions, the moral becomes painfully clear. The first choice was to depart on a VFR flight plan in marginal weather or to stay on the ground. Given the innate maneuverability of a helicopter and its ability to land almost anywhere, the decision to attempt the flight isn't surprising. The crew's second decision—to make a 180 when the weather became too bad to handle—is a classic example of good judgment. It was their next decision, however, which sealed their fate.

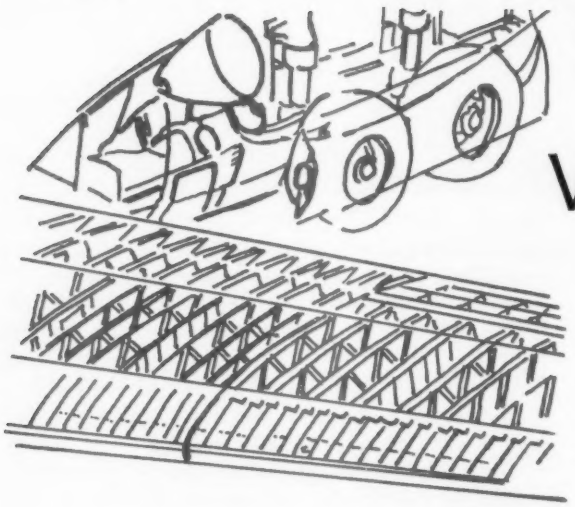
Once they opted to turn around, the crew had several choices. They could have made a precautionary landing on the calm surface of the lake or possibly along the shoreline. They could have continued northbound over the water, maintaining VMC and hoping for better visibility by the time they reached the vicinity of the base. They could have requested an IFR return. Instead, they elected to turn toward an area of rapidly rising terrain which was totally obscured by rain and fog.

The basis of VFR flight is the "see and avoid" rule—and that rule applies to terrain as well as to other airplanes. The message is clear, simple, and direct: If you can't see and avoid, you're not VFR.

A TMF INTERVIEW



Engineer to Pilot



Mr. Jack Paterson, chief of Lockheed's aerodynamics department, talks about the Lockheed airlifters and how they fly.

We spend a lot of time in ground and flying training talking about the finer points of operating our sophisticated airlifters in an increasingly complex environment, but a couple of recent accidents say that we also need to devote some time to the basics. Most of us haven't spent too much time thinking about how an aircraft flies since we were in UPT—and that may have been quite a while. Concepts like angle of attack and coefficient of lift may sound like terms for fighter folks, not the somewhat more sedentary flyers of tactical and strategic transports, but it isn't so. To help us brush up on some basic aerodynamics, we called the people who should know—the aircraft manufacturer's engineers.

In MAC's case, that means our biggest provider of airframes—Lockheed—who let us interview the chief of their aerodynamics department, Mr. Jack Paterson.

Mr. Paterson has been with Lockheed for 22 years and participated in the design and testing of both the C-141 and C-5. He hails from Ireland and is a graduate engineer of the College of Technology at Belfast. Before joining Lockheed he worked for aerospace industries in Ireland, England and Canada.

The interviewers, all pilots, approached Mr. Paterson with the idea of helping to prevent accidents by getting back to the basics of aircraft performance. Mr. Paterson had a lot of information and help to offer (editor's comments added after the interview are in italics).

Pilot: Mr. Paterson, what aerodynamic facts should the transport pilot really understand to fly more safely?

Engineer: He should understand the use of angle of attack—that's the key.

That was the answer we expected, but it presents a real problem because most of our airlifters don't have angle of attack (AOA) indicators. So we asked about the attitude information that the pilot does have.

Pilot: What's the relationship between pitch angle and angle of attack?

Engineer: Pitch attitude is essentially what you get from the attitude gyro. It's the summation of the airplane's angle of attack and the airplane's flight path. For example, on approach with a 2.5- to 3-degree glide slope and an angle of attack of 9 degrees, the pitch is 6 degrees.

Pilot: Statistics show that most accidents happen during the takeoff, approach, and landing phases of flight, so we'd like to explore that realm a bit further. Taking a C-141 in the landing configuration, what margin is there between final approach speed and stall speed?

Engineer: The approach speed is set at 30 percent above the power-off stall speed, so if your final approach speed is 160 knots, then the stall speed is 123 knots for that gross weight. The C-5 has about the same margin. The C-130 has a 35 percent margin. Of course, this is power-off stall speed and the prop wash over the C-130's wings gives more lift in a power-on approach and thus more stall margin.

Pilot: Two of MAC's recent accidents involved flap management problems. What type of flaps are used on the C-141, C-5 and C-130?

Engineer: They're basically what's called a Lockheed-Fowler flap. The Fowler flap travels aft and down, providing chord-wise extension. The Fowler flap was chosen because it produces more lift with less drag than other flap designs.

Pilot: With the Fowler flap, does the first half of the extension produce mostly lift and the last half produce mostly drag?

Engineer: That's generally true. On the 141 the last portion of travel is mostly a rotation of the flap to a higher deflection angle to produce more drag in a small deflection increment.

The C-5 has a more gradual change in deflection angle between the takeoff position and the landing position. There are two takeoff flap settings: 16 degrees and 25 degrees. The reason for two settings is that 16 degrees has a better lift-to-drag ratio at climbout while the 25-degree position gives lower stall speeds. The 16-degree position gives you better obstacle clearance while 25 degrees gives you shorter field length for takeoff. Landing flaps are 40 degrees.

The Fowler flaps on the C-130 are a little different. The leading edges of the Hercules' flaps travel in a circular-arc path giving greatest extension first, then more deflection as the percent of flap extension increases. Takeoff flaps (50 percent) are 18 degrees of deflection, while landing flaps are 36 degrees.

Pilot: How does lowering the flaps affect the stall speed or stall AOA?

Engineer: C-141 stall AOA is 16 degrees in the clean configuration and 12 degrees in the landing configuration—full flaps and gear down.

The C-5 has slats and the stall angle is about 20 degrees with everything hanging—clean, it's about 16 degrees. The actual values are given in figure A1-15 of T.O. 1C-5A-1-1.

To help illustrate these points, Mr. Paterson provided some charts showing the relationship between AOA, airspeed for a given gross weight, and the coefficient of lift (C_L) for different configurations. The coefficient of lift formula allows us to eliminate the effects of air density, wing area, etc., from the

charts and get a better picture of the relationship between AOA and lift produced. A look at figures 1 through 3 shows some interesting facts:

The maximum coefficient of lift ($C_L$max) for each curve represents the greatest AOA attainable before the aircraft stalls.

In each case, putting the flaps down moves the curves up and to the left, indicating a decrease in airspeed required for a given AOA and an increase in lift available.

By picking a value along one axis of the chart, keeping it constant, and comparing it to the lift curves, you can explain many familiar flying sensations. For example: Using figure 1, assume a constant AOA of eight degrees, track up to the landing-flaps curve and read to the left to find the C_L. Now do the same thing using the flaps-up curve. You'll notice a big difference in the coefficient of lift. This explains why you get that sinking feeling if you retract the flaps at too low an airspeed or AOA on a go-around.

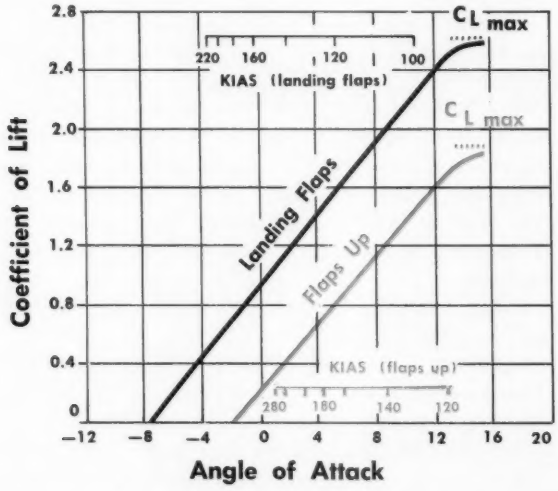


Figure 1: Lift curves for C-130H at 135,000 pounds.

Here's another one. Say you're flying final approach in your C-141 at 132 knots, fully configured. Checking figure 2, you'll find that your AOA should be about three degrees and the C_L 1.32. If you check the no-flap airspeed scale near the bottom of the chart and follow a line up to the flaps-up curve the well-known result of slowing to full-flap approach airspeed without the flaps extended becomes readily explainable.

Pilot: Recent mishaps also show that we need to understand more about the airplane's go-around capabilities. Why do the tech orders instruct us to retract the flaps during a go-around?

Engineer: Flap retraction during go-around is always done to increase your climbout capability. But one has to consider several things in a go-around, and the first thing you must do is apply power to the airplane so you can arrest your rate of sink, develop a rate of climb, and accelerate the airplane as fast as possible. Retracting the flaps reduces the drag and gives you better acceleration and better climb capability, but you must accelerate to flap retraction speed first.

Pilot: We've asked a lot of questions about aircraft performance and we know when you make performance charts for the Dash Ones that you use test data from flights done by professional test pilots. Do engineers employ a "fudge factor" for the difference between the abilities of the test pilot and the average pilot?

Engineer: In a way. We try to get enough tests so we have a good pattern of results and then we take a conservative view of that pattern when we design the performance charts. When there are specific human factors involved, such as time to decide to

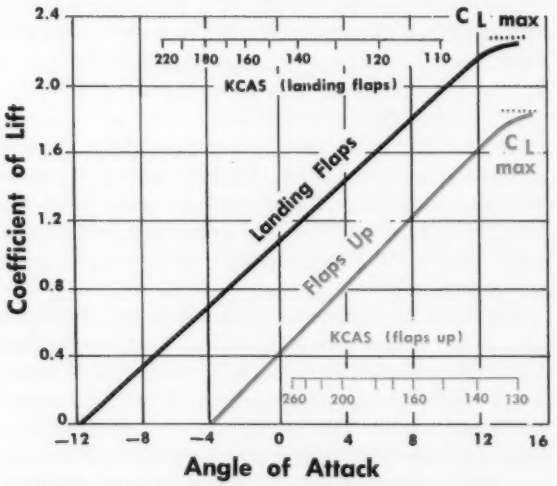


Figure 2: Lift curves for C-141A at 257,500 pounds.

reject a takeoff after an engine failure, then we are very conservative.

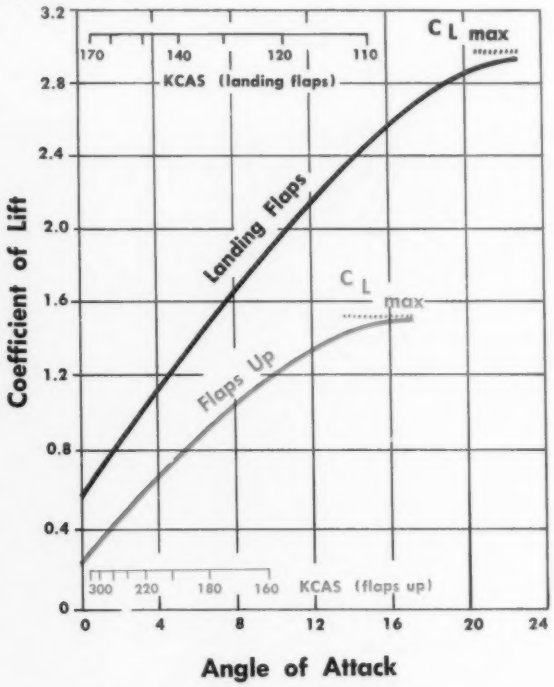


Figure 3: Lift curves for C-5A at 635,850 pounds.

Pilot: While we've got you on the line, Mr. Patterson, we'd like to ask a few general interest questions based on current trends in the aircraft industry and on some minor mishaps. We had a Starlifter damaged recently on landing. What kind of stresses are the Lockheed airlifters designed to take at touchdown?

Engineer: Well, both the C-141 and the C-5 are designed for a 10-feet-per-second rate of descent at touchdown. The C-130 was designed for 9 feet-per-second. That's 600 fpm for the 141 and C-5 and 540 fpm for the Herk.

Pilot: One of the questions often raised is, why were the C-130, C-141 and C-5 built with a high wing?

Engineer: Mostly because the Air Force wanted truckbed-height, straight-in loading capability. And with the props or fan jets hung under the wings, a low-wing airplane would be too tall for easy ground handling if it had the required clearance between the engines and the ground.

Pilot: That's interesting. So how come the popular use of the T-tail that started about the time the C-141 came out and has spread throughout the industry?

Engineer: We can make the tail smaller and lighter by moving it up out of the disturbed airflow caused by the wings.

Pilot: Lockheed is working on a couple of aircraft modifications for the Air Force. Will the handling of the C-141B differ from the C-141A?

Engineer: We've already done the flight tests on the stretch 141 and it handles very much like the A model. There's a little more stability and elevator and rudder authority because the tail is farther from the center of gravity.

Pilot: Will the air refueling capability of the C-141B increase the service life by requiring fewer landings?

Engineer: We designed the 141B for the same landing frequency as the C-141A. But anytime you reduce the number of landings you can save wear on the airplane, which could result in a longer service life.

Pilot: How about the wing mod on the C-5? Any change in handling?

Engineer: Very little. The mod is designed to strengthen the wing box and stiffen the wings. If anything, it will give you a little more aileron authority.

Pilot: Thank you, Mr. Paterson.

After asking Lockheed's aerodynamics expert all those questions, we found there were some questions we needed to ask ourselves. Are we getting a false sense of security from performance data that is always properly computed or from airplanes that rarely have configuration problems? Are we prepared to think about AOA, lift coefficients and other aerodynamic factors if the jackscrews don't crank the flaps down on final and we already have the throttles at idle? And what's the airplane going to do if the copilot pulls the flaps up below three-engine-minimum-control speed on a practice engine-out go-around? Recent mishaps tell us that we need to know how the aircraft flies as much as we need to know how to fly the aircraft.

Strike One -- You're Out

There's more to worry about than bug strikes when you're vibrating over the vegetation in your faithful fling-wing.

It's that time of year again when ceilings are lowering and chopper pilots occasionally try to sneak in under the weather to get home. We all know that staying in VMC may mean getting low enough to take an inventory of the local snakes and toads. But we're all great pilots, so it's no problem navigating safely from treetop to fence post—or is it?

There are hidden killers out there. Unlike trees, hills, bridges, or other obstructions these killers are particularly crafty. They're found everywhere there's habitation and a lot of places where there isn't. They crisscross the countryside in various sizes and shapes. They deploy in different numbers. They are usually difficult, if not impossible, to see. They spread rapidly into newly settled areas. Tangling with them is deadly.

Of course I'm talking about wires—the electrical lifelines of modern civilization. They range from multi-cable high tension lines carried on giant steel towers to single strands supported by wooden poles.

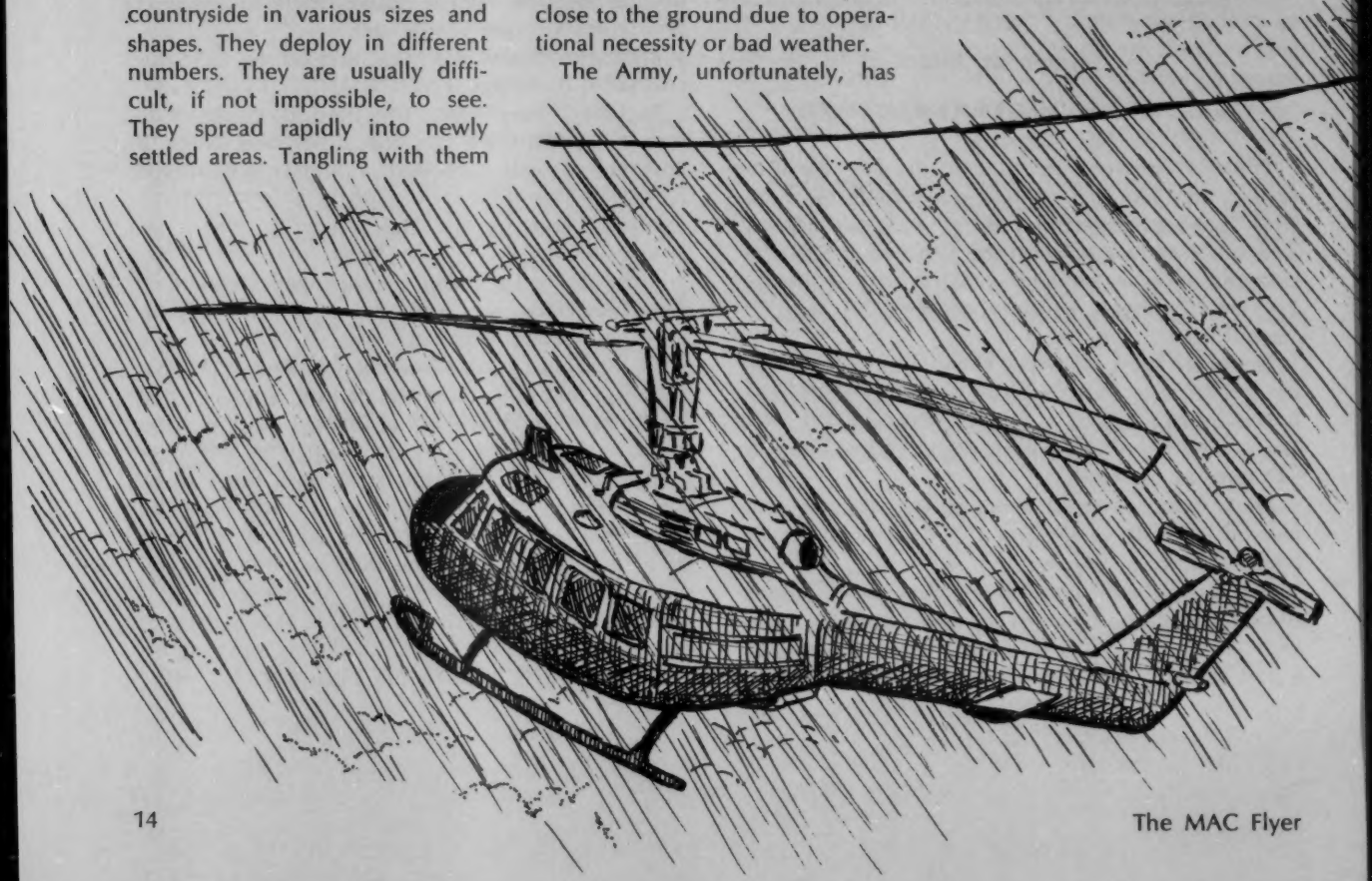
Wires span rivers, usually far above the water. They cross valleys from hilltop to hilltop, sometimes hundreds of feet from the valley floor, and all wires are hard to see.

Although the Air Force hasn't had a serious wire strike in a long time, the potential is there because we often fly our helicopters close to the ground due to operational necessity or bad weather.

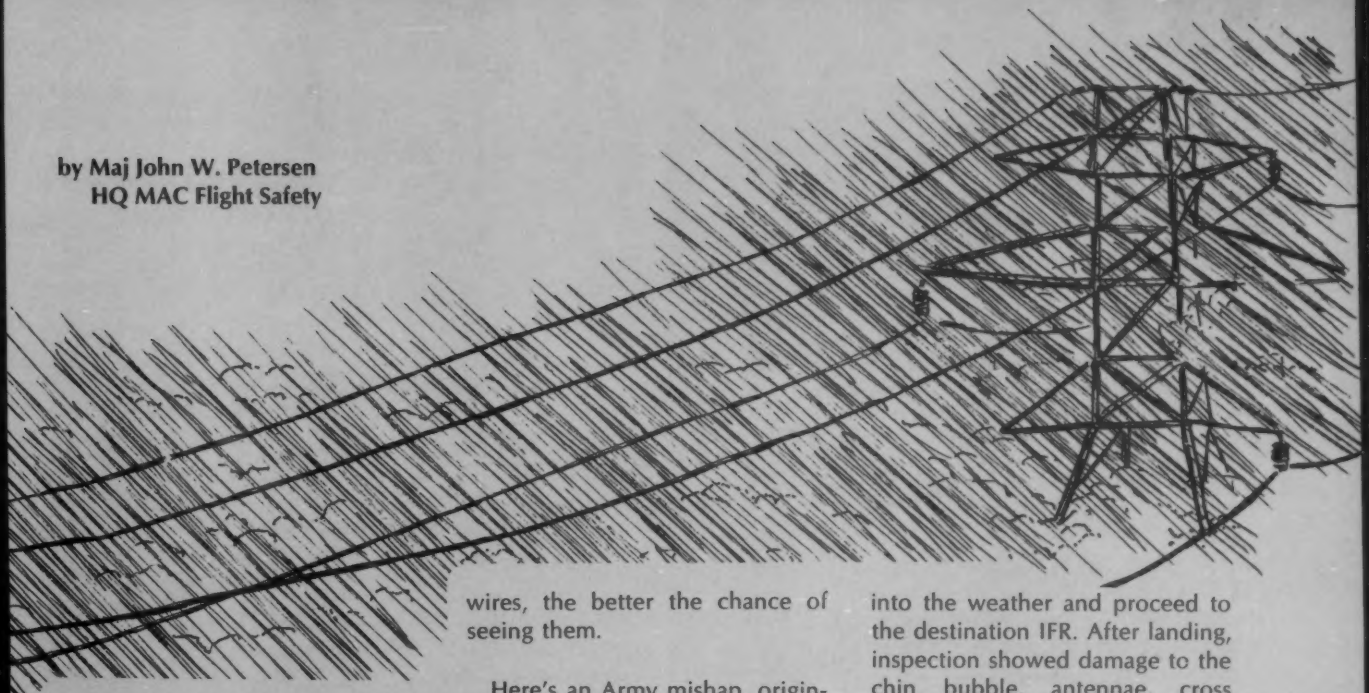
The Army, unfortunately, has had lots of experience with wire strikes: two per month in FY 77 and an average of 2.7 per month in FY 78. Attempting to reverse this trend, they analyzed their wire strike experiences and came up with factors that are common in the accidents.

†Human error is almost always involved in wire strike mishaps (There have been rare incidents that occurred after an inflight mechanical failure).

†Pilots in units with strong command supervision and good flight discipline are less likely to be involved in wire strikes.



by Maj John W. Petersen
HQ MAC Flight Safety



†Most wire strikes occur below 50 feet AGL, with only a few above 150 feet, and none above 300 feet AGL.

†Most wire strikes happen during cruise flight.

†Aerial reconnaissance over unfamiliar terrain is only partly effective in locating wires. For all practical purposes it's virtually impossible to insure all wires are found during an air search.

†Wire strikes seldom occur at takeoff and landing areas where nearby wires are marked.

†Even though no wires are visible they should be suspected along roads and railroad tracks; between hills, poles and structures; and between any pole and a nearby building. Even if there is only a single pole in open country the possibility of wires exists.

†The position of the sun, type of wires, time of day, and atmospheric conditions (dust, haze, etc.) can drastically affect a pilot's ability to see wires.

†Naturally, the possibility of a wire strike is greatest where there is only a single pilot. The more crewmembers trying to spot wires, the better the chance of seeing them.

Here's an Army mishap, originally reported in *Aviation Digest*, that shows how helicopters can get "strung out" while trying to maintain VMC.

Shortly after takeoff on a routine VFR flight, the Huey crew encountered light rain and lowering ceilings; but knowing the weather to be VFR at their destination, the aircraft commander decided to press on by following an interstate highway that led to the airport. After about 15 minutes the ceiling was down to 400 or 500 feet AGL and visibility was one to two miles in haze; the pilot slowed the chopper to about 50 knots. As the flight continued, the weather forced the helicopter even lower. Because of near total darkness—no moon, stars, or nearby town lights—the crew spent most of their time keeping the highway in sight.

Suddenly, at about 120 feet AGL, the Huey smashed into a 66,000-volt powerline that spanned the highway. The AC elected to continue low level until he was sure the H-1 was controllable. Figuring that the helicopter would keep flying—a lucky guess—the AC decided to climb into the weather and proceed to the destination IFR. After landing, inspection showed damage to the chin bubble, antennae, cross tubes, and searchlight.

Obviously the crew was lucky that the thick power cable didn't destroy a critical component, but they didn't know how lucky they were until investigators looked at the mishap site. To strike that particular wire, the chopper had to fly beneath two other wires which could easily have contacted the main or tail rotor. In fact, the *maximum* separation between the uppermost wire and the tail rotor was three and a half feet. High tension lines crossed the crew's route of flight along the highway at 14 points, but only one set of wires was noted on the current sectional chart—ironically, it was the set the helicopter hit.

Like most accidents, this one can be second-guessed, but the cause is obvious—poor decisions regarding flight in marginal weather. This crew was lucky—they struck only one wire out of three and lived to tell about it. Less fortunate flyers have found that when you play games with wires, you play by their rules: Strike one—you're out.

WB-50 Superfortress

The Boeing WB-50 is a modification of the B-50 Superfortress and looks a lot like its older cousin, the famous B-29. Between 1955 and 1966 the WB-50 gave Air Weather Service the long-range air sampling and weather reconnaissance capabilities it needed.

The WB's were converted B-50D's with the addition of meteorological observation equipment, Doppler, weather radar, and a bomb bay fuel tank. They were powered by four Pratt & Whitney R-4360-35 radials, and the D-model's range was 4,900 statute miles which it covered at 277 mph. Cruise ceiling was

36,000 feet. The Superfort's wing span was 141 feet 3 inches; its length, 99 feet; and its max gross weight, 173,000 pounds.

Despite having the least impressive safety record of any aircraft ever to serve with AWS, the WB-50 did yeoman's service, including numerous tropical storm penetrations and a mission that required daily flights from Elmendorf AFB, Alaska, to the North Pole and back. The arrival of modern turbine-powered aircraft put an end to the Superfort's career as WB-47's, WC-130's and WB-57's took over its jobs.

Flight Lines

Crash Survivability

Reference TSgt Dale C. Ferguson's letter in the May 1978 "Flight Lines" concerning medevac crewmembers and his concern for their crash survivability. In your reply, you stated that "the experts are still looking for some material that's fire-retardant, not superexpensive, and natty-looking for you people who have to impress patients and passengers."

First of all, it seems to me that it would not be too difficult to come up with a Nomex flight suit in a color other than olive drab, comparable to what the Thunderbirds wear (although theirs are not Nomex). Secondly, while I recognize the necessity of presenting a professional appearance to patients and passengers, how "natty-looking" would a flight nurse be, covered with melted polyester double-knit, trying to evacuate her patients? How impressed would an injured VIP be with a pilot trying to open the entrance door or overwing hatch covered with a fine ash of charred cotton? It appears that concerning aircrew apparel, priorities have been misplaced.

1st Lt Carl Gustafson
1866 FCS (AFCS)
Scott AFB, Illinois

★ The HQ MAC staff has prepared a General Operational Requirement (GOR) for an improved flight uniform for both male and female crewmembers, which is being forwarded to the Air Staff. The new uniform, if approved, should be both smart looking and fire retardant.

Straight Arrow

While a group of Girl Scouts were visiting our facilities here at Little Rock AFB, they were shown a slide presentation to familiarize them with the base. It began with a slide of the MAC emblem. Later, one of the young ladies asked what the three arrows on the emblem stood for. I have contacted a number of people in an effort to find out, but haven't had much luck. Perhaps *The MAC Flyer* can help in coming up with an answer to this puzzle.

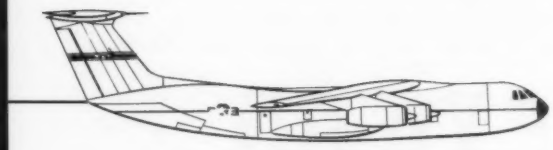
SSgt Ronald Boyle
16 TATS/TAIS
Little Rock AFB, Arkansas

★ According to the keeper of the legendary annals of the illustrious airlift command, the MAC Historian, the three crossed arrows on the MAC patch represent the three armed services served by MAC. Our chief scribe was also happy to point out that the blue globe with gold latitude and longitude lines stands for the scope of MAC's activities and service operations, while the wings suggest the command's flying mission. If you are interested in researching this subject to its most jocular extreme, we suggest digging up a copy of The MAC Flyer dated December 1968 and checking out C.R. Terror's account of how the three arrows came to be a part of the MAC emblem. We do recommend that you stick to the MAC Historian's version, though, for the benefit of the Girl Scouts or any other young and impressionable folks you encounter on future tours.

Different Point of View

Your July 78 article concerning the fate of Southern Airways Flight 242 was typically good and to the point. However, I ran across an article relating to the same accident, with a different point of view, in a civilian journal.

Apparently the crew was not as well informed about the weather upon departure as you made them out to be, although they did receive a sigmet en route. Both articles did point to the fact that no timely weather information found its way into the cockpit, but you people missed what I think was a major factor—airlines often penetrate severe weather for the sake of schedule reliability. There were two other flights in the same area that night, but since both landed safely, their crews have only a good hangar story about a



wild night over Georgia and maybe a little wisdom to show for it.

The crew of the 242 could be swapping stories, too, if only a few things had happened differently. Let's not forget the thin line that sometimes separates "mission hacking" and an accident.

Sgt Dave Tyler
Little Rock AFB, Arkansas

★ After reading the number of accident reports that we see every month and noting the debates that go on as to just what factors each board member and reviewing official considers to be significant, we can appreciate your comments on the Flight 242 article. All things considered, however, we still stick to the conclusions that were reached by the author. Two things we try to avoid if at all possible are speculation and unfounded allegation, and saying that the airlines often penetrate severe weather for the sake of schedule reliability certainly falls into that category. No such conclusions or causal factors were disclosed in any of the reports or background information we had access to on 242's tragic mishap. We couldn't agree more with the sentiment of your closing sentence, though. No amount of dedication, perseverance and drive amounts to much if, in the process of "hacking the mission," we circumvent safety precepts and splatter an airplane on the landscape.

T-Tail, T-Tail, On the Wall . . .

I'm sending a photo of a mural painted by one of our AFROTC students here at the University of Wyoming. Alan Arnold of Arvada, Colorado, used the AAVS photo of a C-141 flying past Mount Rainier as his model. The painting is done in oils and took over two months to complete. Alan claims he wanted to paint a C-5, but the wall wasn't big enough.

Maj Paul G. Johnson
Det 940, AFROTC
University of Wyoming
Laramie, Wyoming

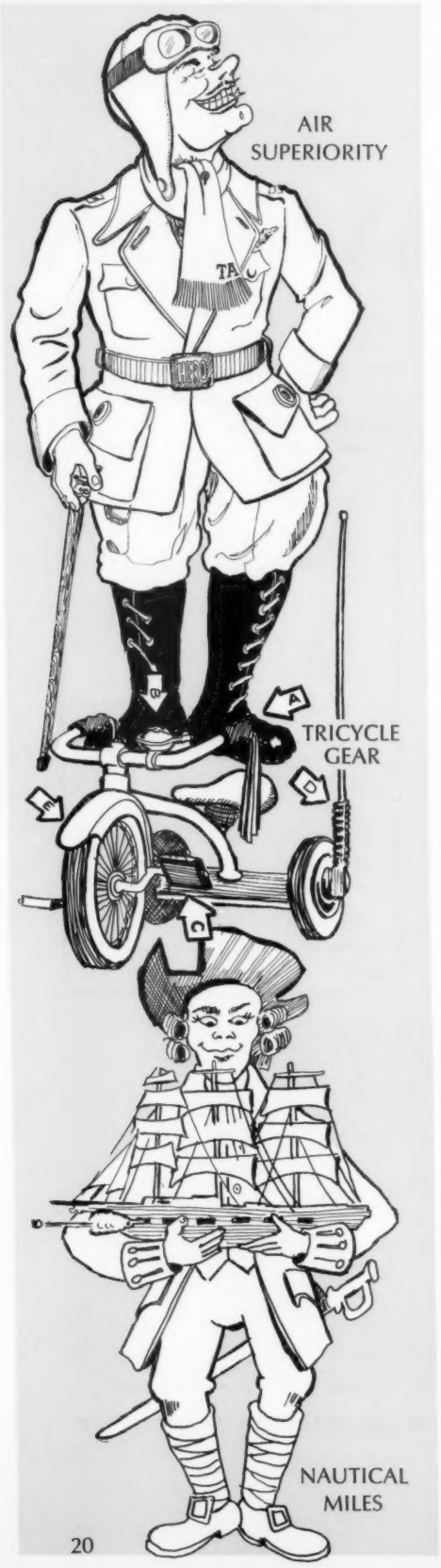
★ Thanks for the picture and the story on Cadet Arnold. If he ever finds a wall large enough for his C-5 painting, we'd like to see that picture too.

We welcome letters from our readers and print all that space and good taste will allow. Send your letters to:

The Editor, *The MAC Flyer*
HQ MAC/IGFE
Scott AFB IL 62225

We'd like to have signed letters; however, we'll withhold the name at the author's request. Letters concerning controversial subjects are acceptable, but please address specific issues rather than personalities. We reserve the right to print letters whole or in part.

Cadet Arnold shows off his handiwork to Colonel Charles L. Jones, Professor of Aerospace Studies.



An Airlift Lexicon

We've noticed on occasion that non-flyers sometimes get a little bewildered by the profusion of technical terms that litter the pages of *TMF*. Unfortunately, there's not much we can do about that. Since the magazine is aimed at MAC aviators, we need to use a lot of aviator's shorthand to get our message across in the allotted 32 pages. However, we recently came across a neat little pamphlet published by the gallant gentlemen of the Confederate Air Force. It's called the *Aviation Glossary*, and it's full of witty, wacky, and fascinating definitions of all those strange words and acronyms that fliers use. Since we know a good idea when we steal one, we figured it might be appropriate to do the same with our own airlift jargon. So, without further ado, we present *The Airlift Lexicon*.

ACCIDENT REPORT: Loud noise made by an aircraft striking the ground.

AERIAL PORT: Sweet, heady wine from western Europe, served in first class on Gourmet Airways.

AIR BASE: Bottom of the air.

AIRCREW MEMBER: For example, the copilot's left leg.

AIRLIFT: A pneumatic British elevator. (Two color combinations available—brown and green or gray and white.)

AIR EVACUATION: The process of creating a vacuum.

AIRSTRIP: Ecdysiastic routine performed aboard an aircraft.

AIR SUPERIORITY: Attitude commonly encountered among fighter pilots.

ALTIMETER SETTING: The place into which the altimeter is positioned.

ASSAULT LANDING: One designed to do maximum damage to the runway.

ASTRONOMICAL TRIANGLE: One female and two male astronomers or vice versa.

BEAM WIDTH: Distance across the bottom half of a bikini.

BRIEF: To spend a long time talking about nothing.

CIRCULAR ERROR: Miscalculation made by a big wheel.

CLASS B BACHELOR: A husband, once removed.

CREW REST: Period of frenzied activity between flights, occasionally interrupted by sleep.

CREW DELAY: Disease which, although rare, is usually fatal.

DEAD RECKONING: Failure analysis, as in "Well, sir, I reckon the INS is dead."

DZUS FASTENER: Gadget that fastens da zus to da airplane.

EMERGENCY GENERATOR: Device which generates emergencies. Also known as a simulator.

ENROUTE SUPPORT: Substance which supports an airplane enroute to somewhere. Also known as air.

ETIC: Cryptic word used frequently by maintenance. The equivalent of scratching the head and shrugging the shoulders.

INS: Intermittent Navigation System (see "Dead Reckoning").

JOINT EXERCISE: Therapy for elbows, knees, etc.

KNOT: Adverbial form of "Kno."

LANDING LIGHT: Preferable to landing heavy.

LETDOWN PLATE: Type of china used to serve in-flight meals during descent.

METEOROLOGIST: One who studies meteors.

NAUTICAL MILES: Units of measurement named after their discoverer, Captain Miles Standish, who became so enamored of boats and sailing that he came to be known as "Nautical Miles."

PERMISSIVE TDY: More fun than regular TDY.

STAGE CREW: The folks who change the scenery between acts.

STEP CLIMB: Usually performed by crewmembers carrying hibachi pots when entering the transient quarters.

TRANSIENT QUARTERS: Temporary domiciles which continually move from place to place and are thus difficult to find.

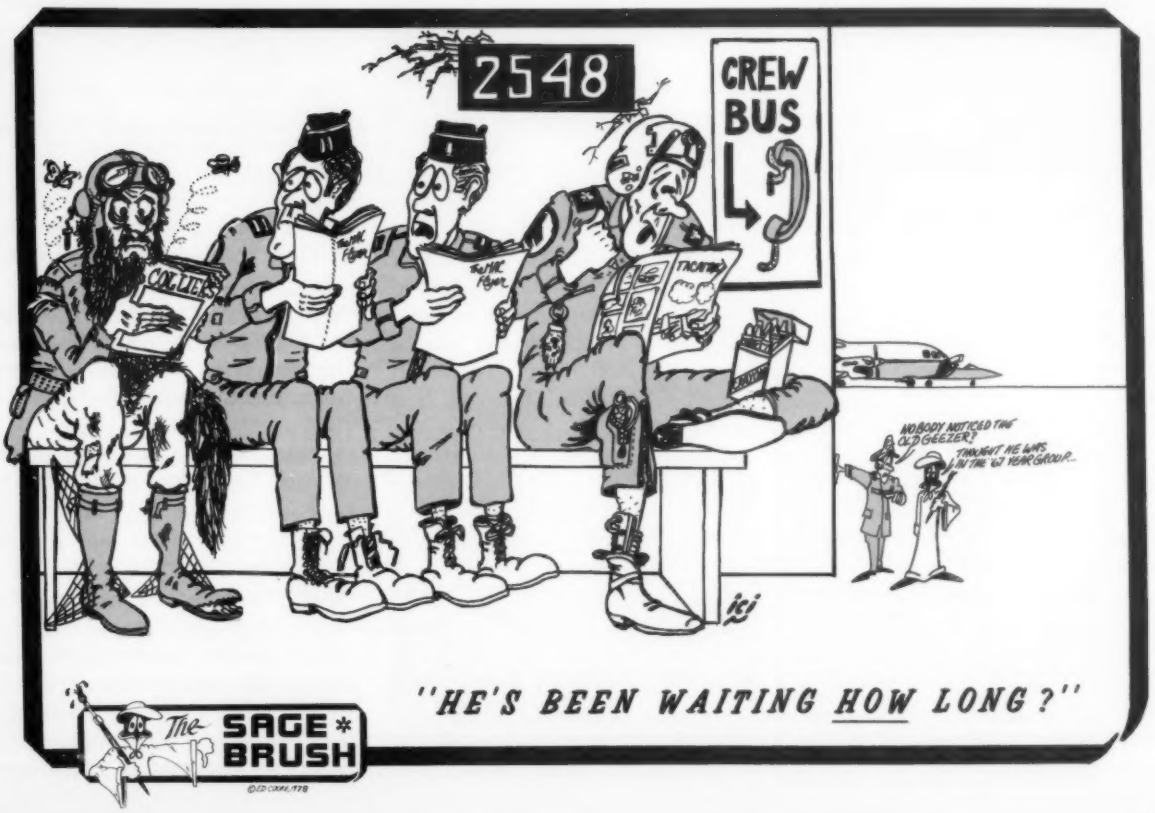
TRUE AIRSPEED: The velocity of true air. Very little of this substance is currently available.

TRICYCLE GEAR: Pedals, a bell, handlebar streamers, etc.

VFR: As used in a weather forecast, means Very Frequently Rotten.

VMC: Another forecaster's term meaning Very Marginal Conditions.

WIND FACTOR: A number derived from a formula which explains why two airplanes flying in opposite directions in the same general area can both experience headwinds.



GLOBAL NOTES

One of the Very Best

SSgt Robert L. La Pointe, 71 ARRS, Elmendorf AFB, Alaska, was chosen as one of 12 Air Force enlisted people named as Outstanding Airmen of the Year for 1978.

Sergeant La Pointe, a pararescue specialist, participated in saving the lives of 20 persons. He also planned and led the first successful climb of Mt McKinley by Air Force members. During the climb, he saved the life of an injured climber at the 16,000-foot level.

In Control

While operating in IMC, an HH-53C crew encountered an emergency which left their aircraft only marginally controllable for instrument flight. The failure of the electrical supervisory panel caused the Automatic Flight Control System to lose its pitch and roll functions and the pilot's attitude indicator to precess 30 degrees. The AC, Maj Edward D. Harrow, HQ ARRS, Scott AFB, Illinois, controlled the aircraft by using the copilot's attitude indicator and then directed troubleshooting of the failed systems. Although the Dash One does not give procedures for the failure of the electrical panel, Major Harrow and other crewmembers analyzed the problem and took corrective actions which restored the systems, including the pilot's attitude indicator. However, on GCA approach, the indicator again failed. Captain Harrow transferred control to the copilot who completed the approach to a safe landing. For their ability to handle an extremely serious emergency without established procedures and for their knowledge and teamwork, the MAC Distinguished Individual Safety Award was presented to Major Harrow and to Maj George W. Lightner and TSgt Dennis L. Bowling, 55 ARRS, Eglin AFB, Florida.

Rugged Rescue

Capt Ronald C. Cunningham, 71 ARRS, flew his HH-3 and crew up a narrow mountain pass and landed the helicopter in gusty winds, poor visibility, and rain to rescue 17 men from a mountain glacier in Alaska. The men had been stranded by a storm while trying to recover the bodies of three mountain climbers who had fallen from a 500-foot ridge. After locating the bodies, the rescuers had been lashed by a storm that left them soaked by rain and exposed to the elements for three days. Although forced to leave the victims of the fall behind, the helicopter crew loaded the 17 exhausted men aboard. After giving careful consideration to his aircraft's performance capabilities, Captain Cunningham coaxed the heavily loaded helicopter into a hover and toward the glacier lip. He then piloted the HH-3 down the glacier face to gain airspeed for a safe return trip through the pass.

Describing the recovery, one of the survivors later wrote, "In 25 years as a rescueman, I have never seen or experienced such a difficult helicopter operation, executed so brilliantly, as on this day."

Captain Cunningham was chosen to receive the Aviator's Valor Award presented annually by a New York City post of the American Legion.

Deja Vu*

*(day-zha-voo), [Fr. lit., already seen], the illusion that one has previously had a given experience.

Try to think of an airfield with just about every drawback you can imagine, and you've probably still got a better place to land than Sparrevohn AFS, Alaska.

Located 150 miles from the nearest major airport, King Salmon, and situated 165 miles west of Elmendorf AFB, Sparrevohn has a 4,000-foot gravel-surfaced runway (34/16) surrounded by troublesome terrain.

Sparrevohn has no taxiways and the edges of the parking ramp aren't marked. At the upper edge of the ramp is a 30-foot cliff and at the lower a 15-foot dropoff. Some of the numerous additional hazards and quirks to be found include:

- a VASI not usable for all aircraft.
- non-frangible landing zone markers on both sides of the 150-foot-wide strip.
- an unusable overrun on 34 caused by a two-foot lip at the threshold.
- frequent winds in excess of 20 knots that can cause severe turbulence approaching the descent point.

Had enough? There's more, but the fatal crash of a C-130 at Sparrevohn not long ago offers undeniable proof that you and your crew had better have it all together when your itinerary includes a time out at this treacherous little airpatch.

Sparrevohn AFS

Alaska (Elevation 1,573 feet)

Surrounded by rugged terrain, Sparrevohn features a 500-foot hill a little more than a mile out on final.

The terrain limits takeoffs to runway 16 and landings to runway 34. This Herk is about halfway down the steep slope of 16.

The runway isn't quite so hard to spot when it's surrounded by snow, but things are different in the summer.

Will the Ambient Aeronaut aviate again? Striving to stay on status, C.R. submits to some serious scrutiny at the School of Aerospace Medicine.

(second of two parts)

Recap—When we left the World's Greatest Aviator last month, he was anticipating a trip to San Antonio, Texas. His TDY to the School of Aerospace Medicine located at nearby Brooks AFB for a complete physical evaluation had come about because of an alarming episode of irregular heartbeat that occurred while he was in the hospital at his home station. We rejoin him as he is deplaning from the medevac C-9 at Kelly Field . . .

Aha, once again I return to Sunny San Antone," mused the tamale-loving Terror as he stepped onto the ramp at Kelly. Already awaiting his arrival with a vehicle to take him to Brooks was a pert, two-striper airperson. After an awkward moment, the gallant global gallivanter relented and let the insistent distaff driver wrestle his overstuffed B-4 and embroidered hangup bag into the trunk of the blue taxi.

Bright and early the next morning, C.R. caught the shuttle bus outside the BOQ and took a ride around the golf course to the "SAM" building. As soon as he had signed in with the sergeant at the front desk in the large lobby, the newly arrived inspectee got a briefing on what to expect and a multiple-page form full of squares for the various areas of his anatomy that were to be examined during the next three days. "Looks straightforward enough," pronounced the overconfident aviator. "All I have to do is get the right squares filled and I'm back in the saddle again, so to speak . . . Piece of cake."

The bliss born of ignorance of the thorough scrutiny he was about to undergo was shattered by the first stop on the phobic flyer's corporeal shopping list—the laboratory. "Hey, I didn't come here to donate," he protested as the polite corpsman asked him to assume the prone position on an examination table.

"Don't worry, Major, reassured

the technician in white, "it's just that we take a little more blood than you're probably used to, and we want you to be comfortable." C.R.'s eyes were still clamped shut tightly in anticipation of more punctures when the efficacious NCO announced that he was finished for the time being and offered to help ease the apprehensive aviator to his feet.

Interspersed between more or less familiar tests were a host of exotic physical examinations available only at SAM or a limited number of elite civilian medical facilities. Stripped to his bare essentials, C.R. was situated face up in a coffin-like container with a flexible sling that supported him from head to toe. This apparatus was pushed into a semi-dark, crypt-like chamber where mysterious scanning machinery determined the ideal body weight of the Magnificent Major. "Machine must be out of calibration," he speculated defensively when it pronounced that he should be maintaining about thirty pounds less beef than his current scale-tipping total.

X-rays and the dental exam were routine, but the ENT check definitely had the "Brooks touch." "Stick out your tongue, please," requested the doctor, "and say, 'Ahhhhh' while I look down your throat with this laryngoscope." But the minute the tongue depressor was applied to the ticklish Terror's "T-Zone," he gagged so hard the doctor had to back off. After two or three unsuccessful repetitions, the ENT examiner sprayed sensation-deadener down the Great One's gaping maw, but even that wouldn't stop the choking and gagging every time the depressor and tube were inserted into his throat. Finally, the exasperated doctor resorted to his *coup de grace*, and threading the tube into C.R.'s gullet via his right nostril, he got the desired perusal of Terror's tonsils.

"I don't understand all the gagging, doc," quipped the Unquenchable Quaffer as he was about to leave. "I never have any trouble getting Terroriffic 'Tinis down my hatch."

The nicotinic major also had an opportunity to find out how much effect his propensity for gold-ringed Egyptian Ovals was having on his pulmonary functions. "Not too bad for a smoker," appraised the technician in charge of the spirometer after the exhaler *par excellence* had practically deflated himself into a heap on the floor—blowing with all his might into the mouthpiece of the electronic lung analyzing device.

"It only stands to reason, Sarge," boasted the breathless but smug smoker, "I only inhale on every third puff, and I always use my microtronic charcoal-and-cellulose filtered, computer-programmed ebony cigarette holder any time I feel the need to appease my palate with a bit of nicotine."

"Right on, sir," concurred the bemused but unimpressed four-striper.

Suitably attired in his blue and white custom coordinated jogging outfit, the Pudgy Perambulator was hot to trot as the med techs in the treadmill room went about attaching electronic pick-ups to various locations on his chest. When his turn on the treadmill finally arrived, some of the major's confidence faded as he observed the strapping young jock-type captain ahead of him being helped off the machine. The young turk was flushed, soaked with sweat and barely able to support himself as the technicians guided him down the steps and over to an examination table.

Apprehensive but not cowed, C.R. observed somewhat prematurely, "Hey, this isn't so bad after all," as soon as he was hooked up to the monitors and had adjusted himself to the rather brisk pace and the strangeness of

walking without going anyplace. In a couple of minutes he felt a slight shift in the machinery and noticed that he had to put a little more effort into his stride. No sooner was he adjusted to that than the machine cranked in some more incline. The eager beaver was now beginning to feel he was hiking up the side of Mount Everest, and he had no way of telling that he had only been on the treadmill for four or five minutes.

"Let us know when you feel tired enough to get off," warned the NCO who stood at the ready on a platform beside the endless belt. But the plucky aviator stubbornly waved him away and forged ahead on his journey awhile longer. Finally, almost overcome with fatigue and estimating that he had battled the escalator to exhaustion for at least half an hour or more, C.R. yielded to his screaming leg muscles, overtaxed tendons and heaving chest. Limp as a dishrag, he was assisted from the in-place exhausticator back to an examination table where his vital signs could be monitored until he cooled down.

"How long did I go?" he managed to gasp.

"You lasted for nine minutes, sir," said one of the techs, "Not too shabby for an 'old' man."

Back in the shower, after he had finished recuperating somewhat, the over-walked O-4 was feeling somewhat proud of his endurance as he struck up a conversation with a wiry-looking, salt-and-pepper grey-haired gentleman who was just slipping into his eagle-emblazoned blue shirt. "How long did you hang in there on the treadmill, sir?" C.R. couldn't resist asking after exchanging introductory pleasantries.

"Well, I can't understand it," puzzled the colonel as he inhaled deeply through his flared nostrils, rolled his shoulders a couple of times and flapped his outstretched arms and hands to loosen up a bit, "I was down two minutes from last year . . . only lasted twenty-three this trip. How about you, major?"

"Well, sir, I, uh, didn't remember to ask how long I was on," fibbed the crestfallen Terror as he bent over and became very busy buckling his black handmade leather flying jodhpurs.

On the third day at his final conference with one of the SAM flight surgeons, Doctor Arrowstraight, C.R. received a rundown on his physical condition. "All your tests and examinations look normal, major," the flight doc said as he paged through the most recent entries to the corpulent one's equally bulky medical records. "Hearing's a bit weak in certain ranges like most pilots who have logged a lot of time in C-124s; you're a bit overweight, and your triglycerides are just within tolerance but on the high side. Heart monitor and brain waves look normal. All in all, you're in pretty good shape for the shape you're in."

"Does that mean I get back on flying status, doc?" beamed C.R. anxiously.

"Well, not exactly," said the breaker of bad news, "Even though none of the tests turned up any cardiovascular problems, we still can't give you a recommendation for a waiver without being absolutely sure you don't have a subtle coronary difficulty of some sort, and there's only one way to make absolutely certain—a cardiac catheterization."

"But I thought that after all the EKGs, the 24-hour heart monitor, the treadmill and all those other exotic probings you gave me that you'd know I was OK," protested C.R. "Your staff has checked parts of me I didn't even know I had."

"I can understand your feelings," reflected Arrowstraight

with limited sympathy, "but it's either a cardiac cath or permanent grounding. We've got to make certain the atrial fibrillation you had wasn't the result of coronary disease before we can make a recommendation to the Air Force in your case. If the cath doesn't turn up any cardiovascular problems, we can, in addition to recommending you for a waiver, give you a pretty good guarantee that you won't have a heart attack or stroke in the next ten years—if you take care of yourself. On the other hand, if something does turn up, we'll send you over to Wilford Hall and have it fixed."

"Gee, doc, I don't know . . . I was hoping I wouldn't . . ." trailed off the temporarily befuddled barnstormer.

"Think it over," advised Arrowstraight as he closed C.R.'s folder. "If you decide to go with the cath, you can be scheduled early next week or later on. The choice is up to you. But keep in mind that we have one of the finest catheterization labs in the world, and we haven't lost a patient yet even though there is a slight element of risk involved."

"I like to fly, doc," said the Sultan of Surly Bond Slippers, "and I've never been one to wallow in indecision. So, put me on your cath calendar ASAP and we'll get this business over with in one TDY."

A week later, the thoroughly catheterized air carrier of boxes and paxes stood by the curb at the Brooks BOQ waiting for his transportation back to Kelly for the hop home. Several times he admired his badge of courage—an extra wide bandaid over the four stitches in the crook of his right arm where the tiny, flexible teflon catheter tube had been inserted. The good words the doctor had said about his pumper and plumbing as they viewed his catheterization films together still echoed happily in his mind. Almost on schedule, a blue Air Force chariot wheeled up in front of him and the female civilian driver inquired gruffly, "You Major Terror?" After insuring that he was her intended passenger, the WG-5 got out of her vehicle, opened the trunk and stood aside, waiting for the slightly intimidated traveler to toss in his baggage. Remembering his experience with the demure but determined distaff driver who had picked him up at Kelly, and the warning from the cath surgeons that he wasn't to pick up anything for a few days, C.R. waited for the driver to do the loading.

Finally overcome with impatience, the hefty Air Force cabbie heaved a sigh that temporarily increased the size of the numeral on her football jersey pullover by at least two digits. Turning on her sneaker-clad heel to redeposit herself in the driver's seat, she tossed back over her shoulder, "You certainly don't expect a *lady* to load your luggage for you, do you, Major?"

"Sometimes you just can't make a nickel," mumbled C.R. as he picked up his bags with his left hand and loaded them into the trunk. He barely had himself inside and the rear door closed when he was whooshed away.

"I hope you have Lieutenant Fudge up to speed on Awards and Decs, Terror," bellowed Lieutenant Colonel LeBeouf, the squadron ops officer, as he filled the doorway of the small cubicle C.R. had been using for an office since his return from Brooks.

"The flight surgeon just called and said your waiver came back from headquarters approved. As of now, you are relieved of duties as the squadron Shakespeare and reinstated in the requalification training program. We've set you up for a double shuttle to Tehran leaving tomorrow at 0400."

"No doubt about it," mused the global Gusto Grabber, "I'm definitely back on status."

Quick Stoppers

Don't Let George Do It

Flight control malfunctions in the Starlifter fleet seem to be getting pretty numerous lately—here's a recent one. The T-tail was cruising at FL 290 and 430 KTAS when it abruptly pitched up five degrees and climbed 300 feet. The crew disconnected the autopilot and checked for trim problems, but everything seemed normal, so they reconnected the autopilot. About half an hour later, the Starlifter rolled into a 45-degree left bank and the "tab operable" light for the left aileron came on. This time the crew left the autopilot off and diverted to an en route base for repairs.

Maintainers found that the autopilot control panel was sending spurious, garbled, and otherwise off-color signals to the autopilot system. They also found that a bent switch bracket on the left aileron tab caused the "tab operable" light to illuminate even though the tab was locked out. Since there has been such an increase of C-141 autopilot problems recently, keep this tip in mind: If "George" won't straighten up and fly right, it might be wise to cut him off and let the copilot log a little stick time.

Load Abuse

The loadmaster has to be pretty agile to rig an airdrop load during flight. A little bumpy air makes the job a lot harder, and real turbulence makes it downright dangerous. Here's a sampling of recent loadmaster-injury incidents.

The Hercules crew finished a CDS drop and the pilot climbed the 130 toward 1,500 feet AGL to get out of turbulence so the loadmasters could rig the next load. The sergeants started their work during the climb. Unexpectedly, the C-130 entered severe turbulence (minus 0.5 to plus 2.0 G's), and the cargo and loadmasters were tossed around in the airplane's belly. One bundle came down on a loadmaster's ankle. Fortunately, he suffered only a bad sprain and severe bruises—it could have been a lot worse.

Here's another incident that shook up a crew. The loadmaster didn't respond to the ten-minute-warning checklist so the AC sent the engineer back to check on him. The FE found the loadmaster unconscious, sprawled face down across the rails. The navigator went back to help and the two of them got the passed-out sergeant on oxygen. The turbulence at 500 feet AGL hadn't seemed very rough up front—the crew later said it was light chop—but it was enough to trip the loadmaster as he bent over to secure his life line. He fell, hit his chin, and instantly KO'd himself. He was released after 24 hours in the hospital with only a bruised chin.

The moral for the folks up front is that the bumps are a lot harder in back where you have to walk around to do your job.

C-5 Sieve

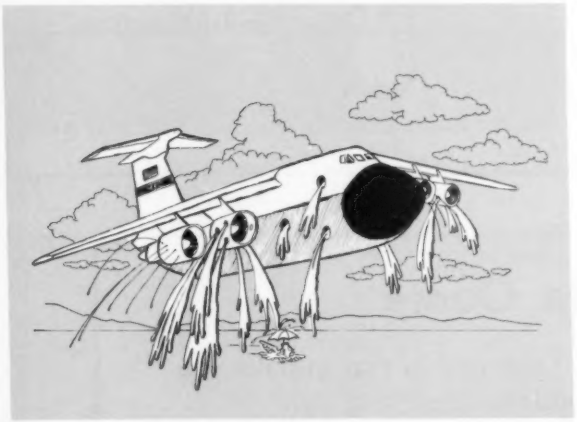
Locating a leak in your roof can be tough, but when you're trying to track down the source of some seepage in a C-5, you've really got problems. This particular Galaxy developed leaks around the inboard engines just after level-off for an overwater flight to home station. Transferring fuel stopped the leak on number two, but the crew had to shut down number three and bring the big bird back. Maintainers couldn't find any holes to plug, so they signed the maxijet off as ready to fly.

The following day was an instant replay—almost. The inboards started leaking again at FL 350, but this time fuel transfer didn't help. The Galaxy drivers shut down the inboards, dumped fuel, and brought the machine back again. After landing, they spotted another leak—on number four. They shut that one down, too.

This time the aerospace plumbers really dug into the leaky Leviathan. After several engine runs, they found the following:

- A leaking hydraulic line on the number two engine.
- A leaking pressurization and dump valve on number three engine.
- A leaking number four aux inboard access panel.
- Five leaking tapered fasteners on the front spar of the left wing.
- A wing root leak in the number two main fuel tank.

As far as anybody could tell, about the only place there weren't any leaks was in the roof.



A Friend In Need

Although the ultimate responsibility for flight safety remains with the aircrew, every once in a while the air traffic control folks can do a lot to help out. At an East Coast base, a controller was credited with preventing a midair when a private pilot, who hadn't bothered to check in when passing through the TCA, intruded on a C-130's airspace. The Herky was descending through 1,400 feet on a PAR-monitored ILS approach, and was about four miles from touchdown when the errant civil aircraft showed up on radar—a mile and a half away and converging. The controller informed the Herk crew about the traffic at their 11 o'clock position, then quickly gave instructions for an evasive turn when they couldn't locate the fast-closing traffic visually. During the turn, the crew finally sighted the trespasser. Both aircraft executed further avoidance maneuvers, and the C-130 drivers estimated that there was about 500 feet of separation as the two planes passed.

A tip of the *TMF* flight cap goes to the guys who sit in darkened rooms endlessly watching the glow of CRT's and making sense out of a profusion of little blips.

QS

One Moment, Please

An experienced C-130 pilot was making practice assault landings under the watchful eye of an instructor. On the first landing, he pulled the throttles quickly into reverse with no hesitation in ground idle. This drew a caution from the instructor. The second time around, the student moved the throttles a little more slowly, but still didn't pause in ground idle—and this time the reason for the instructor's warning became abundantly clear. The Herk swerved toward the left side of the runway as the student fought to regain control with asymmetric power. The left main gear and nose gear left the runway, taking out a runway light and slicing up a nose gear tire. Finally the instructor got the wayward turbopropper under control by shoving the throttles into ground idle and feathering number four.

To coin a new aphorism: When you're shifting a Herk into reverse, he who hesitates is smart.

Numbers Game

If you don't think a single digit can be a matter of life and death, try this incident on for size. A C-9 was making a radar approach to an overseas base with rapidly rising terrain to the west of the final approach course. The crew read back a clearance to 2,500 feet on a heading of 270. They were aware that the altitude was too low for terrain clearance but continued the descent since they were in VMC. Finally, they advised the controller that they were turning to the north to clear the terrain; the controller responded with an immediate clearance to 3,500. Once on the ground, the crew filed a Hazardous Air Traffic Report.

During the HATR investigation, playback of the tapes told an interesting story. The air evac's clearance had actually been to 3,500, not 2,500. But the crew had read back the wrong altitude, and the controller hadn't caught the mistake. Since the crew was aware of the terrain hazard and was in VMC, nothing came of the communications breakdown. But it doesn't take much imagination to see how easily the results could have been tragically different.

Notable Quote

Time will erase the painful memory of that mistake you just made. So will the next mistake.

—*Approach*

After Deadline

THIS MONTH'S COVER: If you look very closely, you may spot some discrepancies between the C-5 pictured on the cover and the real airplane. There's a good reason: The cutaway drawing was originally published in Great Britain in 1966 and was based on what the big bird was supposed to be like. How many variations can you pick out?

ERRONEOUS OIL PRESSURE INDICATIONS are becoming a problem in the C-141 fleet. The source of the trouble is a batch of oil pressure transmitters with manufacturing defects which cause the gauges to read about 5 psi above normal operating limits. The logistics folks hope to have the faulty transmitters purged from the supply system by December or January.

PARDON OUR ERROR--The C-141A may be an endangered species, but it's not going to become extinct as we stated in an August "After Deadline." There are five Starlifters which won't get the stretch treatment--four At AFSC's Aeronautical Systems Division and one NASA bird. So if you start getting nostalgic for "Ol' Stubby" a few years from now, you'll know where to find one.

A NEW LOOK FOR "THE BOOK": A revised MACR 55-130 should arrive in the field during the next couple of months. Based on a test conducted by three Herk units last year, the new reg is a consolidation of C-130 directives into a single publication. It'll be issued in chapters, with crewmembers required to carry only the chapters which apply to them (for example, if you're not LAPES-qualified, you don't carry the LAPES info). The same type of consolidation is in the works for all other MAC aircraft.

NEXT MONTH: The flydoc has some words of wisdom about cold weather and your bod, "Mishap with a Moral" reviews a commercial airline crash at Bali, "Deja Vu" takes you to Yokota . . . and the Bandersnatch Warning Light comes on.

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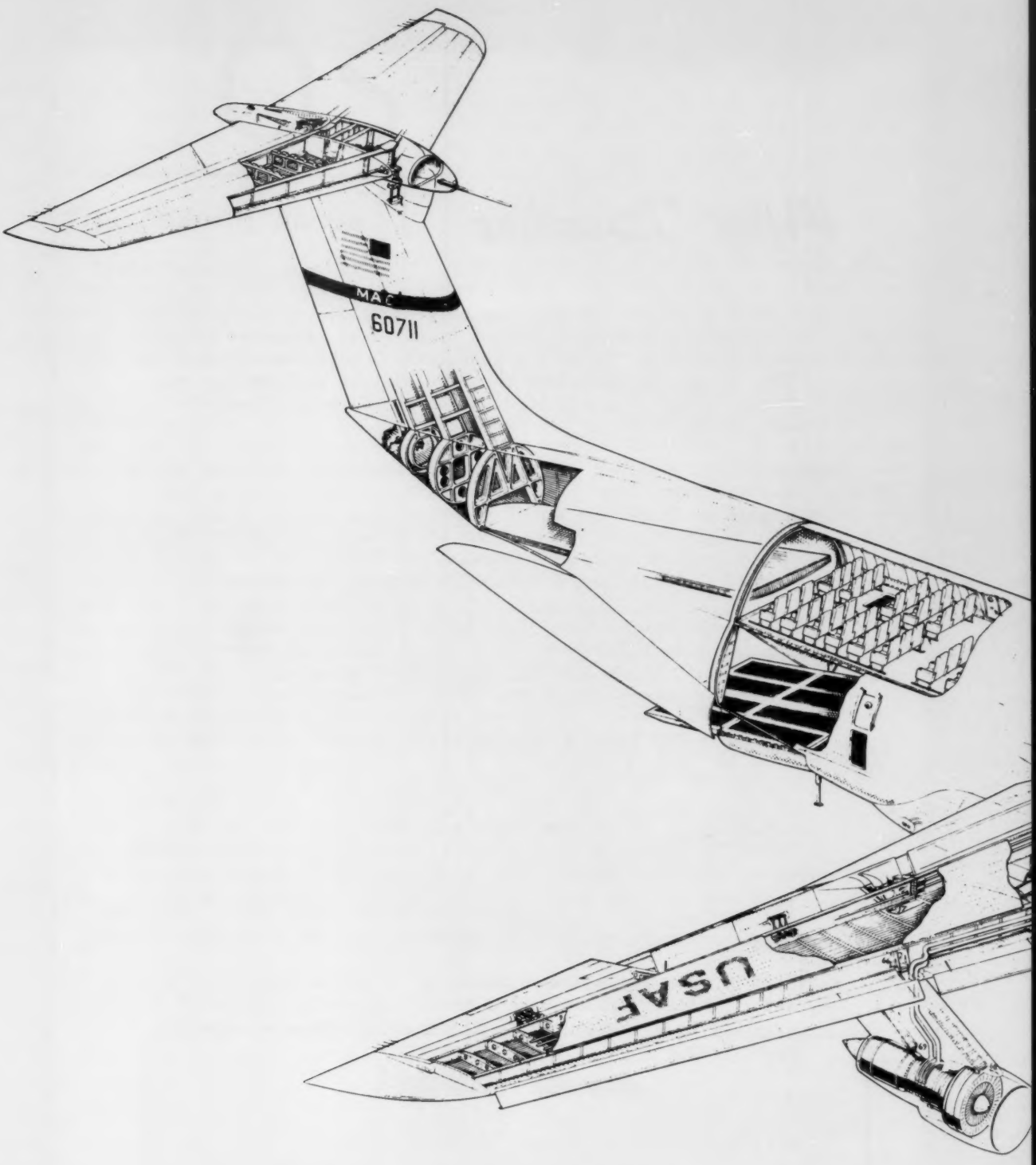

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